



# Object Detection

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Industry standard capacitive sensors are M12 to M30 tubular housings. For small parts detection or installation in tight mounting spaces, however, smaller form factors are needed. The Balluff product line therefore offers a large selection of sizes and form factors. The small capacitive sensors can be calibrated simply using a separate sensor amplifier. And their rugged stainless steel housing ensures reliability even under challenging conditions.

Capacitive sensors from Balluff employ a straight-line electrical field. These sensors detect solid bodies (e.g. wafers, PCBs, cartons, paper stacks, bottles, plastic blocks and plates) and sense liquids through walls made of glass and plastic (thickness max. 4 mm).

Advantage: The straight-line electrical field also enables media having a low dielectric constant to be detected.



### DC 3-wire

- Tubular housings
- Disc types
- Block-style
- Stick-on sensor

### DC 4-wire

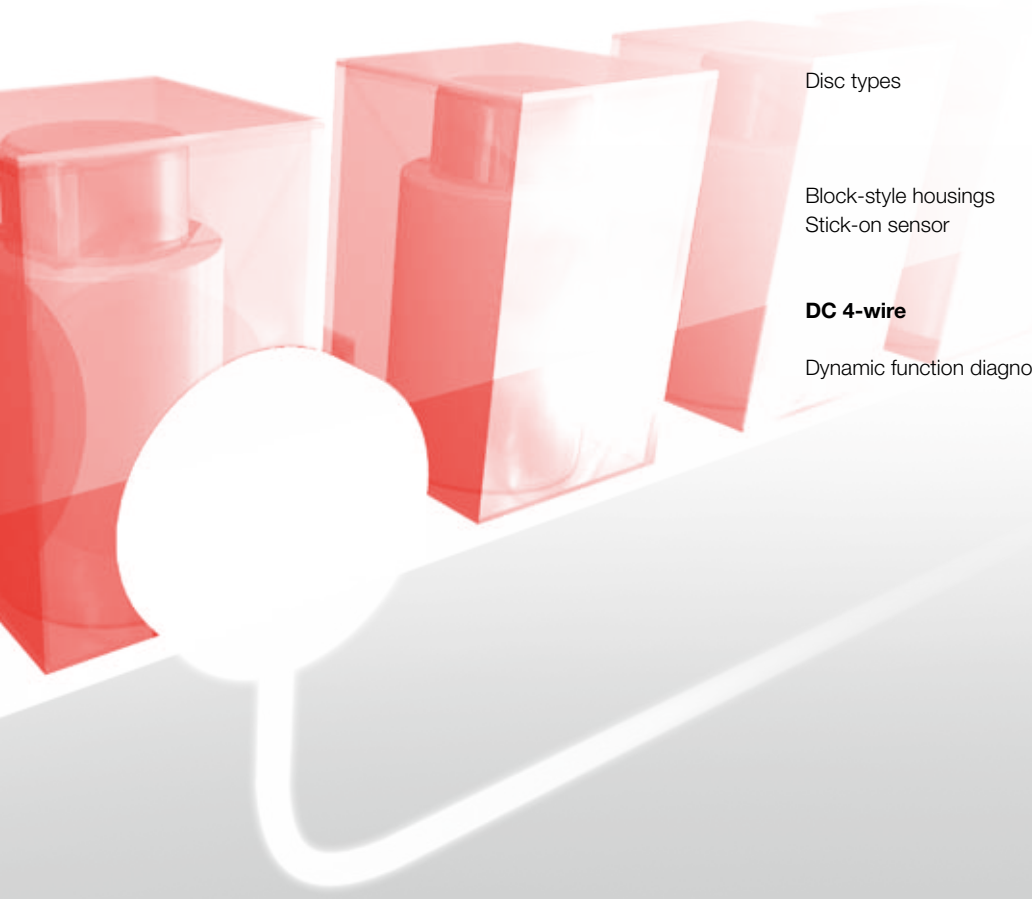
- Dynamic function diagnostics

### DC 3-wire

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	Stick-on sensor	90x16x4 mm

### DC 4-wire

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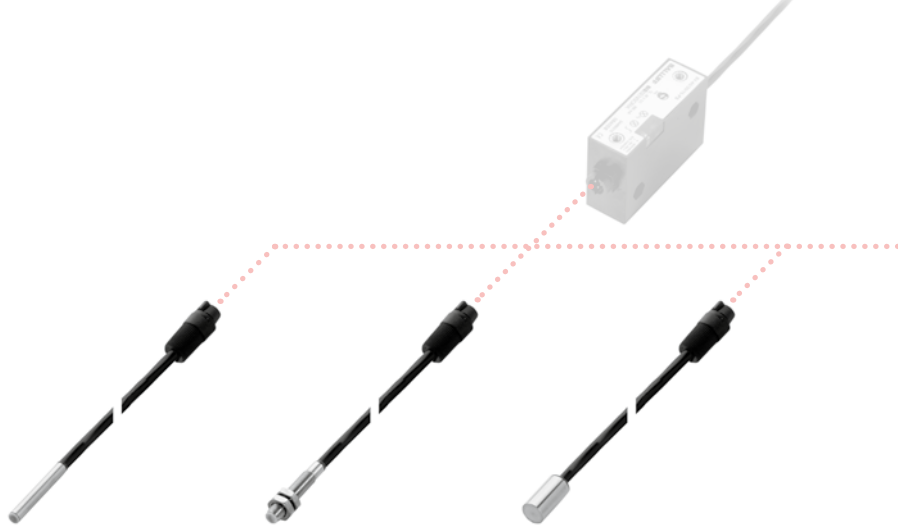


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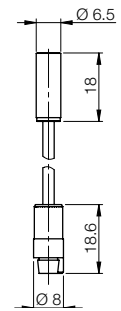
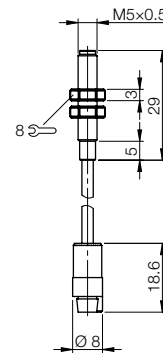
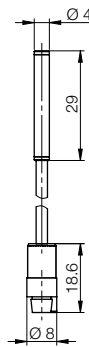
# Object Detection

DC 3-wire · Tubular housings  
 Ø 4 mm, M5, Ø 6.5 mm



Housing size		Ø 4 mm	M5×0.5	Ø 6.5 mm	
Mounting		flush	flush	flush	
Rated switching distance $s_n$		0.1...1 mm	0.1...1 mm	0.1...1.5 mm	
With sensor amplifier	<b>Ordering code</b>	<b>BCS0010</b>	<b>BCS0011</b>	<b>BCS0012</b>	
	Part number	BCS G04T4D-XXS10C-EP02-GZ01-002	BCS M05T4C-XXS10C-EP02-GZ01-002	BCS G06T4B-XXS15C-EP02-GZ01-002	
PNP Normally open	<b>Ordering code</b>				
	Part number				
PNP Normally closed	<b>Ordering code</b>				
	Part number				
NPN Normally open	<b>Ordering code</b>				
	Part number				
NPN Normally closed	<b>Ordering code</b>				
	Part number				
Supply voltage $U_s$		4...8 V DC	4...8 V DC	4...8 V DC	
Voltage drop $U_a$ at $I_o$					
Rated insulation voltage $U_i$		75 V DC	75 V DC	75 V DC	
Output current max.					
No-load supply current $I_o$ max.					
Reverse polarity/short circuit protected					
Ambient temperature range $T_a$		-30...+80 °C	-30...+80 °C	-30...+80 °C	
Switching frequency $f$		100 Hz	100 Hz	100 Hz	
Output function indicator					
Degree of protection per IEC 60529		IP 67	IP 67	IP 67	
Material	Housing	V2A	V2A	V2A	
	Sensing face	PTFE	PTFE	PTFE	
	Cover	POM	POM	POM	
Wiring		2 m cable PUR, 3×0.14 mm <sup>2</sup>	2 m cable PUR, 3×0.14 mm <sup>2</sup>	2 m cable PUR, 3×0.14 mm <sup>2</sup>	

For sensor amplifiers see  
 Accessories section  
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# Object Detection

DC 3-wire · Tubular housings  
M30, Ø 6.5 mm



DC 3-wire

Tubular housings

Disc types

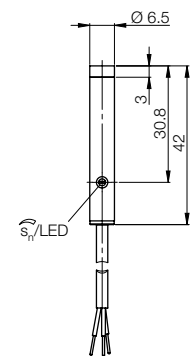
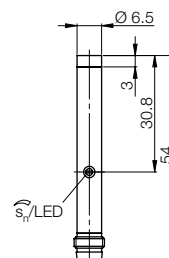
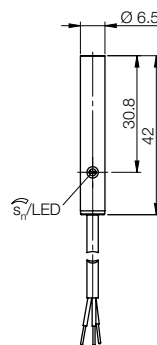
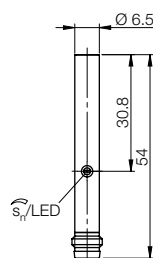
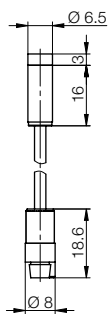
Block-style

Stick-on sensor

DC 4-wire

Dynamic function diagnostics

	Ø 6.5 mm non-flush 0.1...3 mm <b>BCS0013</b> BCS G06T4B-XXS30G-EP02-GZ01-002	Ø 6.5 mm flush 0.1...1.5 mm <b>BCS001R</b> BCS G06T4D2-PSM15C-S49G	Ø 6.5 mm flush 0.1...1.5 mm <b>BCS001L</b> BCS G06T4E1-PSM15C-EP02	Ø 6.5 mm non-flush 0.1...3 mm <b>BCS0022</b> BCS G06T4D2-PSM30G-S49G	Ø 6.5 mm non-flush 0.1...3 mm <b>BCS001Y</b> BCS G06T4E1-PSM30G-EP02
		<b>BCS001T</b> BCS G06T4D2-POM15C-S49G	<b>BCS001M</b> BCS G06T4E1-POM15C-EP02	<b>BCS0023</b> BCS G06T4D2-POM30G-S49G	<b>BCS001Z</b> BCS G06T4E1-POM30G-EP02
		<b>BCS001U</b> BCS G06T4D2-NSM15C-S49G	<b>BCS001N</b> BCS G06T4E1-NSM15C-EP02	<b>BCS0024</b> BCS G06T4D2-NSM30G-S49G	<b>BCS0020</b> BCS G06T4E1-NSM30G-EP02
		<b>BCS001W</b> BCS G06T4D2-NOM15C-S49G	<b>BCS001P</b> BCS G06T4E1-NOM15C-EP02	<b>BCS0025</b> BCS G06T4D2-NOM30G-S49G	<b>BCS0021</b> BCS G06T4E1-NOM30G-EP02
	4...8 V DC	11...30 V DC	11...30 V DC	11...30 V DC	11...30 V DC
	75 V DC	≤ 2 V 75 V DC	≤ 2 V 75 V DC	≤ 2 V 75 V DC	≤ 2 V 75 V DC
		50 mA ≤ 10 mA	50 mA ≤ 10 mA	50 mA ≤ 10 mA	50 mA ≤ 10 mA
		yes/yes	yes/yes	yes/yes	yes/yes
	-30...+80 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C	-10...+70 °C
	100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
	IP 67	IP 65	IP 65	IP 65	IP 65
	V2A	V2A	V2A	V2A	V2A
	PTFE	PTFE	PTFE	PTFE	PTFE
	POM	PA	POM	PA	POM
	2 m cable PUR, 3×0.14 mm <sup>2</sup>	M8 connector, 3-pin	2 m cable PUR, 3×0.14 mm <sup>2</sup>	M8 connector, 3-pin	2 m cable PUR, 3×0.14 mm <sup>2</sup>



Electrical devices, connectors and holders see Accessories section starting page 69



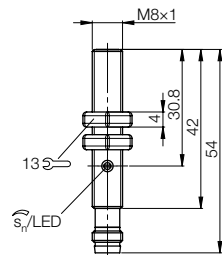
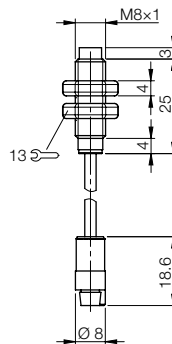
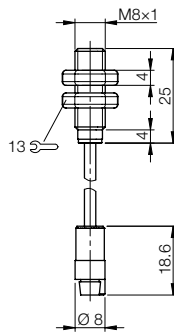
# Object Detection

DC 3-wire · Tubular housings  
M8



Housing size		<b>M8 x 1</b>	<b>M8 x 1</b>	<b>M8 x 1</b>
Mounting		flush	non-flush	flush
Rated switching distance $s_n$		<b>0.1...1.5 mm</b>	<b>0.1...3 mm</b>	<b>0.1...1.5 mm</b>
With sensor amplifier	<b>Ordering code</b>	<b>BCS0014</b>	<b>BCS0015</b>	
	Part number	BCS M08T4C-XXS15C-EP02-GZ01-002	BCS M08T4C1-XXS30G-EP02-GZ01-002	
PNP Normally open	<b>Ordering code</b>			<b>BCS002A</b>
	Part number			BCS M08T4E2-PSM15C-S49G
PNP Normally closed	<b>Ordering code</b>			<b>BCS002C</b>
	Part number			BCS M08T4E2-POM15C-S49G
NPN Normally open	<b>Ordering code</b>			<b>BCS002E</b>
	Part number			BCS M08T4E2-NSM15C-S49G
NPN Normally closed	<b>Ordering code</b>			<b>BCS002F</b>
	Part number			BCS M08T4E2-NOM15C-S49G
Supply voltage $U_s$		4...8 V DC	4...8 V DC	11...30 V DC
Voltage drop $U_a$ at $I_o$				≤ 2 V
Rated insulation voltage $U_i$		75 V DC	75 V DC	75 V DC
Output current max.				50 mA
No-load supply current $I_o$ max.				≤ 10 mA
Reverse polarity/short circuit protected				yes/yes
Ambient temperature range $T_a$		-30...+80 °C	-30...+80 °C	-10...+70 °C
Switching frequency $f$		100 Hz	100 Hz	100 Hz
Output function indicator				LED yellow
Degree of protection per IEC 60529		IP 67	IP 67	IP 65
Material	Housing	V2A	V2A	V2A
	Sensing face	PTFE	PTFE	PTFE
	Cover	POM	POM	V2A
Wiring		2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>	M8 connector, 3-pin

For sensor amplifiers see  
Accessories section  
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# Object Detection

DC 3-wire · Tubular housings  
M8, Ø 10 mm



DC 3-wire

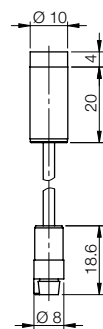
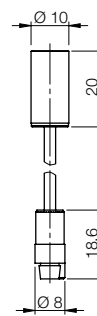
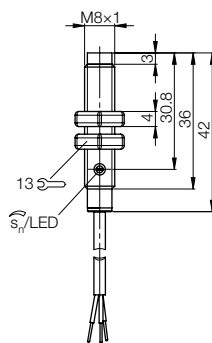
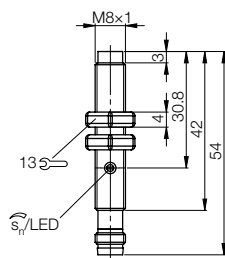
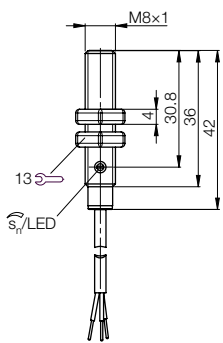
Tubular housings

Disc types  
Block-style  
Stick-on sensor

DC 4-wire

Dynamic function diagnostics

M8 x 1 flush 0.1...1.5 mm	M8 x 1 non-flush 0.1...3 mm	M8 x 1 non-flush 0.1...3 mm	Ø 10 mm flush 0.1...4 mm <b>BCS0016</b> BCS G10T4B-XXS40C-EP02-GZ01-002	Ø 10 mm non-flush 1...8 mm <b>BCS0017</b> BCS G10T4C-XXS80G-EP02-GZ01-002
<b>BCS0026</b> BCS M08T4E1-PSM15C-EP02	<b>BCS002M</b> BCS M08T4E2-PSM30G-S49G	<b>BCS002H</b> BCS M08T4E1-PSM30G-EP02		
<b>BCS0027</b> BCS M08T4E1-POM15C-EP02	<b>BCS002N</b> BCS M08T4E2-POM30G-S49G	<b>BCS002J</b> BCS M08T4E1-POM30G-EP02		
<b>BCS0028</b> BCS M08T4E1-NSM15C-EP02	<b>BCS002P</b> BCS M08T4E2-NSM30G-S49G	<b>BCS002K</b> BCS M08T4E1-NSM30G-EP02		
<b>BCS0029</b> BCS M08T4E1-NOM15C-EP02	<b>BCS002R</b> BCS M08T4E2-NOM30G-S49G	<b>BCS002L</b> BCS M08T4E1-NOM30G-EP02		
11...30 V DC ≤ 2 V 75 V DC 50 mA ≤ 10 mA yes/yes -10...+70 °C 100 Hz LED yellow IP 65 V2A PTFE POM 2 m cable PUR, 3×0.14 mm <sup>2</sup>	11...30 V DC ≤ 2 V 75 V DC 50 mA ≤ 10 mA yes/yes -10...+70 °C 100 Hz LED yellow IP 65 V2A PTFE V2A M8 connector, 3-pin	11...30 V DC ≤ 2 V 75 V DC 50 mA ≤ 10 mA yes/yes -10...+70 °C 100 Hz LED yellow IP 65 V2A PTFE POM 2 m cable PUR, 3×0.14 mm <sup>2</sup>	4...8 V DC 75 V DC	4...8 V DC 75 V DC



Electrical devices, connectors and holders see Accessories section starting page 69



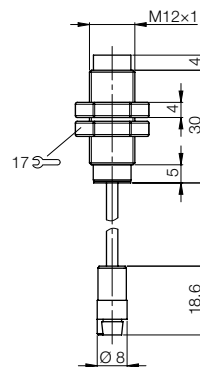
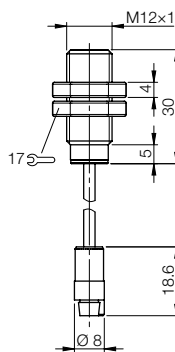
# Object Detection

DC 3-wire · Tubular housings  
 Ø 10 mm, M12

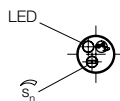


Housing size		Ø 10 mm	M12x1	M12x1
Mounting		flush	flush	non-flush
Rated switching distance $s_n$		1...4 mm	0.1...4 mm	1...8 mm
With sensor amplifier		<b>Ordering code</b>	<b>BCS0018</b>	<b>BCS0019</b>
		Part number	BCS M12T4D-XXS40C-EP02-GZ01-002	BCS M12T4D1-XXS80G-EP02-GZ01-002
PNP	Normally open	<b>Ordering code</b>	<b>BCS002T</b>	
		Part number	BCS G10T4H-PSM40C-EP02	
PNP	Normally closed	<b>Ordering code</b>	<b>BCS002U</b>	
		Part number	BCS G10T4H-POM40C-EP02	
NPN	Normally open	<b>Ordering code</b>	<b>BCS002W</b>	
		Part number	BCS G10T4H-NSM40C-EP02	
NPN	Normally closed	<b>Ordering code</b>	<b>BCS002Y</b>	
		Part number	BCS G10T4H-NOM40C-EP02	
Supply voltage $U_s$		12...35 V DC	4...8 V DC	4...8 V DC
Voltage drop $U_a$ at $I_o$		≤ 0.8 V		
Rated insulation voltage $U_i$		75 V DC	75 V DC	75 V DC
Output current max.		200 mA		
No-load supply current $I_o$ max.		≤ 10 mA		
Reverse polarity/short circuit protected		yes/yes		
Ambient temperature range $T_a$		-30...+70 °C	-30...+80 °C	-30...+80 °C
Switching frequency $f$		100 Hz	100 Hz	100 Hz
Output function indicator		LED yellow		
Degree of protection per IEC 60529		IP 65	IP 67	IP 67
Material	Housing	V2A	V2A	V2A
	Sensing face	PTFE	PTFE	PTFE
	Cover	POM	POM	POM
Wiring		2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>

For sensor amplifiers see  
 Accessories section  
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The flush mount sensors for object detection M12...M30 in plastic or PTFE housing provide IP 68 protection (at approx. 5 bar) at the sensing face.



# Object Detection

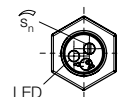
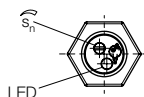
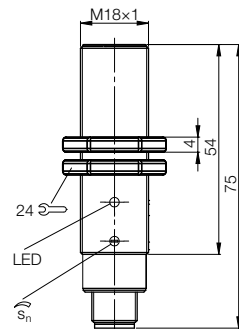
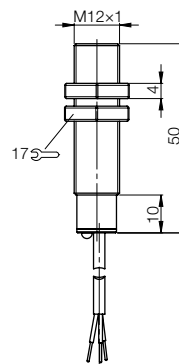
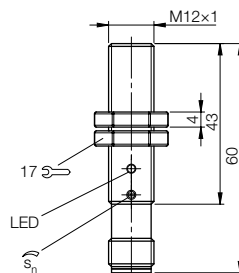
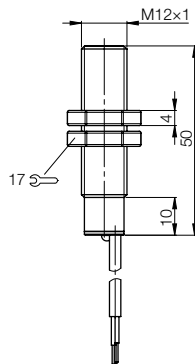
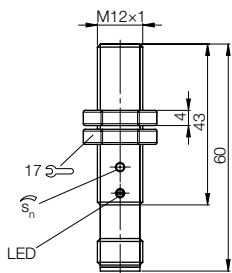
DC 3-wire · Tubular housings  
M12, M18



**DC 3-wire  
Tubular  
housings**  
Disc types  
Block-style  
Stick-on sensor

**DC 4-wire**  
Dynamic function  
diagnostics

M12×1 flush 1...4 mm	M12×1 flush 1...4 mm	M12×1 flush 1...4 mm	M12×1 flush 1...4 mm	M18×1 flush 2...8 mm
<b>BCS0037</b> BCS M12T4D2-PSM40C-S04G	<b>BCS002Z</b> BCS M12T4G1-PSM40C-EP02	<b>BCS003T</b> BCS M12WVD2-PSM40C-S04G	<b>BCS003M</b> BCS M12VVG1-PSM40C-EP02	<b>BCS0047</b> BCS M18B4G2-PSC80C-S04G
<b>BCS0038</b> BCS M12T4D2-POM40C-S04G	<b>BCS0030</b> BCS M12T4G1-POM40C-EP02	<b>BCS003U</b> BCS M12WVD2-POM40C-S04G	<b>BCS003N</b> BCS M12VVG1-POM40C-EP02	<b>BCS0049</b> BCS M18B4G2-POC80C-S04G
<b>BCS0039</b> BCS M12T4D2-NSM40C-S04G	<b>BCS0031</b> BCS M12T4G1-NSM40C-EP02	<b>BCS003W</b> BCS M12WVD2-NSM40C-S04G	<b>BCS003P</b> BCS M12VVG1-NSM40C-EP02	<b>BCS004C</b> BCS M18B4G2-NSC80C-S04G
<b>BCS00AC</b> BCS M12T4D2-NOM40C-S04G	<b>BCS0032</b> BCS M12T4G1-NOM40C-EP02	<b>BCS003Y</b> BCS M12WVD2-NOM40C-S04G	<b>BCS003R</b> BCS M12VVG1-NOM40C-EP02	<b>BCS004F</b> BCS M18B4G2-NOC80C-S04G
12...35 V DC ≤ 0.8 V 75 V DC 200 mA ≤ 10 mA yes/yes -30...+70 °C 100 Hz LED yellow IP 65 V2A PTFE PA M12 connector, 4-pin, A-coded	12...35 V DC ≤ 0.8 V 75 V DC 200 mA ≤ 10 mA yes/yes -30...+70 °C 100 Hz LED yellow IP 65 V2A PTFE POM 2 m cable PUR 3×0.14 mm <sup>2</sup>	12...35 V DC ≤ 0.8 V 75 V DC 200 mA ≤ 10 mA yes/yes -30...+60 °C 100 Hz LED yellow IP 65 PVC PVC PA M12 connector, 4-pin, A-coded	12...35 V DC ≤ 0.8 V 75 V DC 200 mA ≤ 10 mA yes/yes -30...+70 °C 100 Hz LED yellow IP 65 PVC PVC PVC 2 m cable PUR 3×0.14 mm <sup>2</sup>	10...35 V DC ≤ 1.5 V 75 V DC 300 mA ≤ 10 mA yes/yes -30...+70 °C 100 Hz LED yellow IP 67 V2A PBT PA M12 connector, 4-pin, A-coded



Electrical  
devices,  
connectors and  
holders see  
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# Object Detection

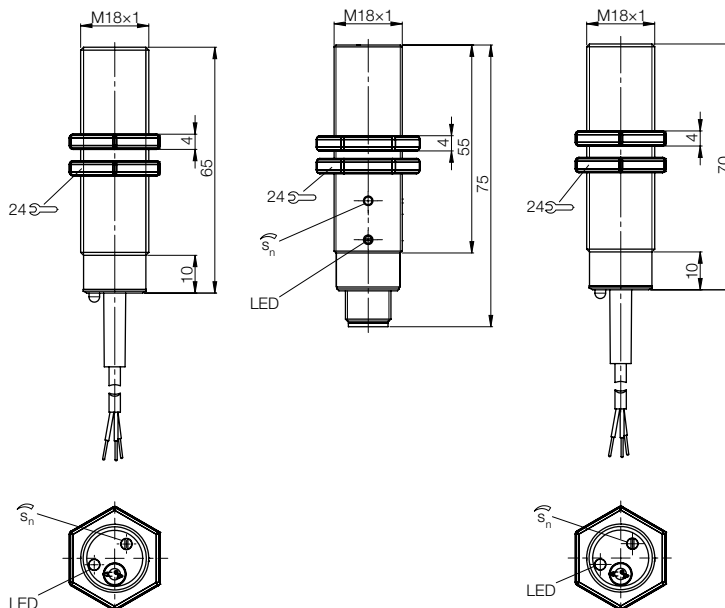
DC 3-wire · Tubular housings  
M18



Housing size	<b>M18×1</b>	<b>M18×1</b>	<b>M18×1</b>
Mounting	flush	flush	flush
Rated switching distance $s_n$	<b>2...8 mm</b>	<b>2...8 mm</b>	<b>2...8 mm</b>
PNP Normally open	<b>Ordering code</b> Part number	<b>BCS0040</b> BCS M18B4M-PSC80C-EV02	<b>BCS0046</b> BCS M18VVG2-PSC80C-S04G
PNP Normally closed	<b>Ordering code</b> Part number	<b>BCS0042</b> BCS M18B4M-POC80C-EV02	<b>BCS0048</b> BCS M18VVG2-POC80C-S04G
PNP NO/NC selectable	<b>Ordering code</b> Part number		
NPN Normally open	<b>Ordering code</b> Part number	<b>BCS0044</b> BCS M18B4M-NSC80C-EV02	<b>BCS004A</b> BCS M18VVG2-NSC80C-S04G
NPN Normally closed	<b>Ordering code</b> Part number	<b>BCS00AE</b> BCS M18B4M-NOC80C-EV02	<b>BCS004E</b> BCS M18VVG2-NOC80C-S04G
NPN NO/NC selectable	<b>Ordering code</b> Part number		
Supply voltage $U_s$	10...35 V DC	10...35 V DC	10...35 V DC
Voltage drop $U_d$ at $I_o$	≤ 1.5 V	≤ 1.5 V	≤ 1.5 V
Rated insulation voltage $U_i$	75 V DC	75 V DC	75 V DC
Output current max.	300 mA	300 mA	300 mA
No-load supply current $I_o$ max.	≤ 10 mA	≤ 10 mA	≤ 10 mA
Reverse polarity/short circuit protected	yes/yes	yes/yes	yes/yes
Ambient temperature range $T_a$	-30...+70 °C	-30...+60 °C	-30...+60 °C
Switching frequency $f$	100 Hz	100 Hz	100 Hz
Power indicator			
Output function indicator	LED yellow	LED yellow	LED yellow
Degree of protection per IEC 60529	IP 67	IP 67	IP 67
Material	Housing: V2A Sensing face: PBT Cover: PBT	PVC PVC PA	PVC PVC PBT
Wiring	2 m cable PVC, 3×0.25 mm <sup>2</sup>	M12 connector, 4-pin, A-coded	2 m cable PVC, 3×0.25 mm <sup>2</sup>



The flush mount sensors for object detection M12...M30 in plastic or PTFE housing provide IP 68 protection (at approx. 5 bar) at the sensing face.





# Object Detection

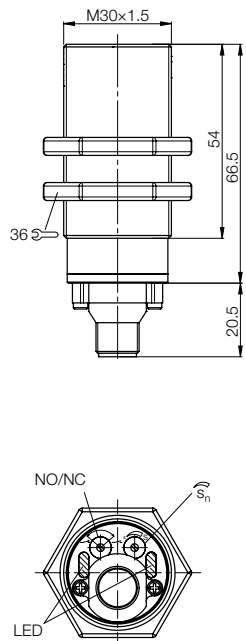
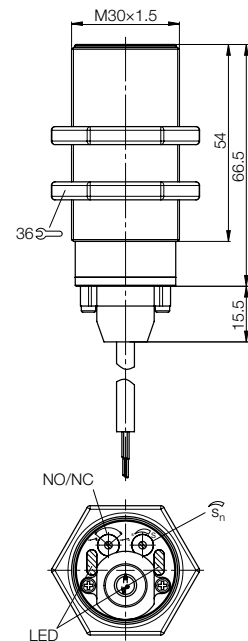
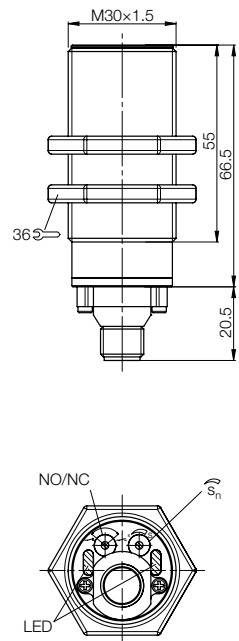
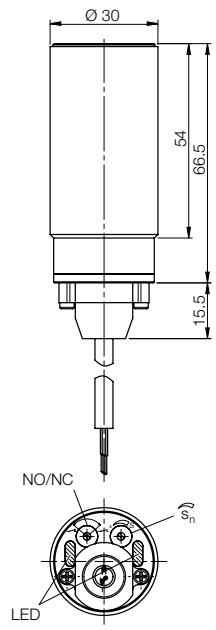
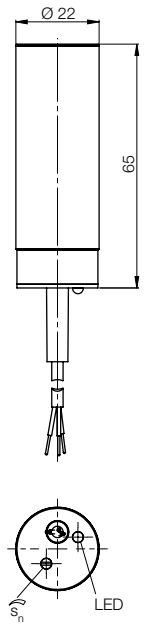
DC 3-wire · Tubular housings  
 Ø 22 mm, Ø 30 mm, M30



**DC 3-wire  
 Tubular  
 housings**  
 Disc types  
 Block-style  
 Stick-on sensor

**DC 4-wire**  
 Dynamic function  
 diagnostics

Ø 22 mm	Ø 30 mm	M30x1.5	M30x1.5	M30x1.5
flush	flush	flush	flush	flush
2...10 mm	2...20 mm	1...20 mm	1...20 mm	1...20 mm
<b>BCS0033</b>				
BCS D22V4M1-PSC10C-EV02				
<b>BCS0034</b>				
BCS D22V4M1-POC10C-EV02				
	<b>BCS004H</b>	<b>BCS004T</b>	<b>BCS004P</b>	<b>BCS004M</b>
	BCS D30B4M3-PPC20C-EP02	BCS M30B4M2-PPM20C-S04G	BCS M30B4M3-PPM20C-EP02	BCS M30BBM2-PPM20C-S04G
<b>BCS0035</b>				
BCS D22V4M1-NSC10C-EV02				
<b>BCS0036</b>				
BCS D22V4M1-NOC10C-EV02				
	<b>BCS004J</b>	<b>BCS004U</b>	<b>BCS004R</b>	<b>BCS004N</b>
	BCS D30B4M3-NPC20C-EP02	BCS M30B4M2-NPM20C-S04G	BCS M30B4M3-NPM20C-EP02	BCS M30BBM2-NPM20C-S04G
10...35 V DC	10...35 V DC	10...35 V DC	10...35 V DC	10...35 V DC
≤ 1.5 V	≤ 1.8 V	≤ 1.8 V	≤ 1.8 V	≤ 1.8 V
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
300 mA	300 mA	300 mA	300 mA	300 mA
≤ 10 mA	≤ 15 mA	≤ 15 mA	≤ 15 mA	≤ 15 mA
yes/yes	yes/yes	yes/yes	yes/yes	yes/yes
-30...+60 °C	-30...+70 °C	-30...+70 °C	-30...+70 °C	-30...+70 °C
100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
LED yellow	LED green	LED green	LED green	LED green
IP 67	LED yellow	LED yellow	LED yellow	LED yellow
V2A	IP 64	IP 64	IP 64	IP 64
PVC	V2A	V2A	V2A	PBT
PVC	PBT	PBT	PBT	PBT
2 m cable PVC, 3×0.25 mm <sup>2</sup>	PBT/PE	PBT/PE	PBT/PE	PBT/PE
	2 m cable PUR, 3×0.34 mm <sup>2</sup>	M12 connector, 4-pin, A-coded	2 m cable PUR, 3×0.34 mm <sup>2</sup>	M12 connector, 4-pin, A-coded



Electrical  
 devices,  
 connectors and  
 holders see  
 Accessories  
 section starting  
**page 69**



# Object Detection

DC 3-wire · Tubular housings  
M30, Ø 34 mm

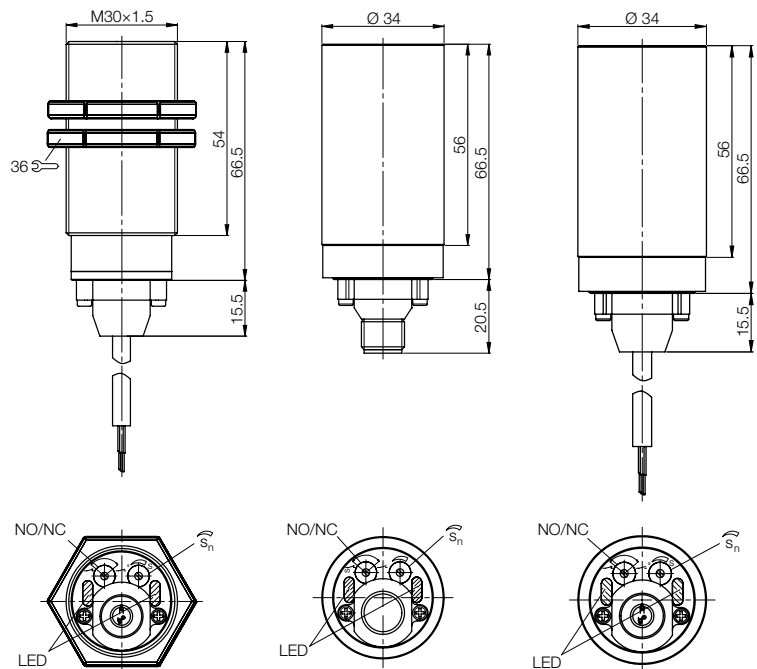


Housing size		<b>M30×1.5</b>	<b>Ø 34 mm</b>	<b>Ø 34 mm</b>	
Mounting		flush	flush	flush	
Rated switching distance $s_n$		<b>1...20 mm</b>	<b>1...25 mm</b>	<b>1...25 mm</b>	
With sensor amplifier	<b>Ordering code</b>				
	Part number				
PNP NO/NC selectable	<b>Ordering code</b>	<b>BCS004K</b>	<b>BCS004Z</b>	<b>BCS004W</b>	
	Part number	BCS M30BBM3-PPC20C-EP02	BCS G34VVM2-PPM20C-S04G	BCS G34VVM3-PPM20C-EP02	
NPN NO/NC selectable	<b>Ordering code</b>	<b>BCS004L</b>	<b>BCS0050</b>	<b>BCS004Y</b>	
	Part number	BCS M30BBM3-NPC20C-EP02	BCS G34VVM2-NPM20C-S04G	BCS G34VVM3-NPM20C-EP02	
Supply voltage $U_s$		10...35 V DC	10...35 V DC	10...35 V DC	
Voltage drop $U_d$ at $I_o$		≤ 1.8 V	≤ 1.8 V	≤ 1.8 V	
Rated insulation voltage $U_i$		75 V DC	75 V DC	75 V DC	
Output current max.		300 mA	300 mA	300 mA	
No-load supply current $I_o$ max.		≤ 15 mA	≤ 15 mA	≤ 15 mA	
Reverse polarity/short circuit protected		yes/yes	yes/yes	yes/yes	
Ambient temperature range $T_a$		-30...+70 °C	-30...+70 °C	-30...+70 °C	
Switching frequency f		100 Hz	100 Hz	100 Hz	
Power indicator		LED green	LED green	LED green	
Output function indicator		LED yellow	LED yellow	LED yellow	
Degree of protection per IEC 60529		IP 64	IP 64	IP 64	
Material	Housing	PBT	PVC	PVC	
	Sensing face	PBT	PVC	PVC	
	Cover	PBT/PE	PBT/PE	PBT/PE	
Wiring		2 m cable PUR, 3×0.34 mm <sup>2</sup>	M12 connector, 4-pin, A-coded	2 m cable PUR, 3×0.34 mm <sup>2</sup>	

For sensor amplifiers see  
Accessories section  
Page 71



The flush mount sensors for object detection M12...M30 in plastic or PTFE housing provide IP 68 protection (at approx. 5 bar) at the sensing face.



# Object Detection

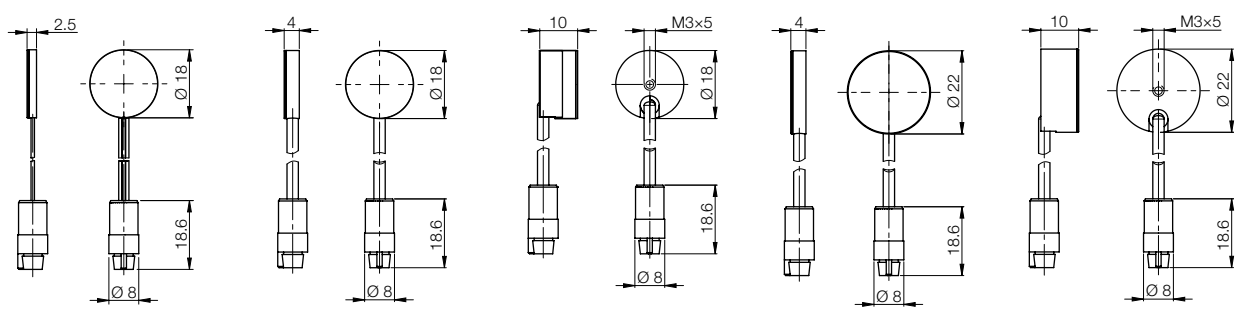
DC 3-wire · Disc types  
 Ø 18 mm, Ø 22 mm



DC 3-wire  
 Tubular housings  
 Disc types  
 Block-style  
 Stick-on sensor

DC 4-wire  
 Dynamic function diagnostics

Ø 18x2.5 mm	Ø 18x4 mm	Ø 18x10 mm	Ø 22x4 mm	Ø 22x10 mm
flush	flush	flush	flush	flush
0.1...3 mm	1...5 mm	1...5 mm	1...10 mm	1...10 mm
<b>BCS001A</b>	<b>BCS001C</b>	<b>BCS001E</b>	<b>BCS001F</b>	<b>BCS001H</b>
BCS D18T403-XXS30C-EP02-GZ01-002	BCS D18T404-XXS50C-EP02-GZ01-002	BCS D18T407-XXS50C-EP02-GZ01-002	BCS D22T405-XXS10C-EP02-GZ01-002	BCS D22T408-XXS10C-EP02-GZ01-002
4...8 V DC	4...8 V DC	4...8 V DC	4...8 V DC	4...8 V DC
75 V DC	75 V DC	75 V DC	75 V DC	75 V DC
-30...+70 °C	-30...+80 °C	-30...+80 °C	-30...+80 °C	-30...+80 °C
100 Hz	100 Hz	100 Hz	100 Hz	100 Hz
IP 66	IP 66	IP 66	IP 66	IP 66
V2A	V2A	V2A	V2A	V2A
PTFE	PTFE	PTFE	PTFE	PTFE
2 m cable PVC, 3x0.09 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>



Electrical devices, connectors and holders see Accessories section starting page 69



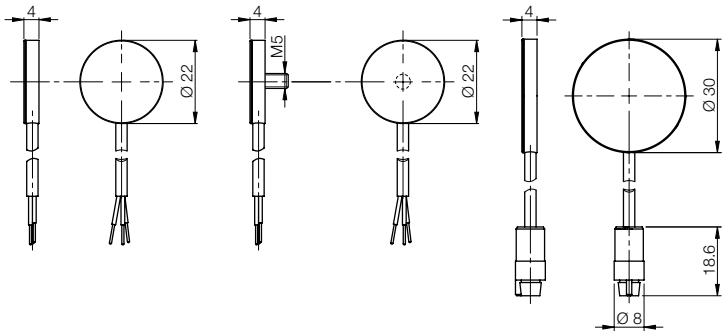
# Object Detection

DC 3-wire · Disc types  
 Ø 22 mm, Ø 30 mm



Housing size		Ø 22×4 mm	Ø 22×4 mm	Ø 30×4 mm
Mounting		flush	flush	flush
Rated switching distance $s_n$		6 mm ±10 %	6 mm ±10 %	1...15 mm
With sensor amplifier		<b>Ordering code</b>		<b>BCS001J</b>
		Part number		BCS D30T406-XXS15C-EP02-GZ01-002
PNP	Normally open	<b>Ordering code</b>	<b>BCS003H</b>	<b>BCS00HK</b>
		Part number	BCS D22T403-PSM60C-EP02	BCS D22T402-PSM60C-EP02
PNP	Normally closed	<b>Ordering code</b>		
		Part number		
NPN	Normally open	<b>Ordering code</b>	<b>BCS003J</b>	
		Part number	BCS D22T403-NSM60C-EP02	
NPN	Normally closed	<b>Ordering code</b>		
		Part number		
PNP/NPN and NO/NC selectable		<b>Ordering code</b>		
		Part number		
Supply voltage $U_s$		12...30 V DC	12...30 V DC	4...8 V DC
Voltage drop $U_d$ at $I_o$		≤ 0.8 V	≤ 0.8 V	
Rated insulation voltage $U_i$		75 V DC	75 V DC	75 V DC
Output current max.		300 mA	300 mA	
No-load supply current $I_o$ max.		≤ 10 mA	≤ 10 mA	
Reverse polarity/short circuit protected		yes/yes	yes/yes	
Ambient temperature range $T_a$		-30...+70 °C	-30...+70 °C	-30...+80 °C
Switching frequency $f$		100 Hz	100 Hz	100 Hz
Output function indicator				
Degree of protection per IEC 60529		IP 64	IP 64	IP 66
Material				
Housing		V2A	V2A	V2A
Sensing face		PTFE	PTFE	PTFE
Cover				
Wiring		2 m cable PUR, 3×0.14 mm <sup>2</sup>	2 m cable PUR, 3×0.14 mm <sup>2</sup>	2 m cable PUR, 3×0.14 mm <sup>2</sup>

For sensor amplifiers see  
 Accessories section  
 Page 71



# Object Detection

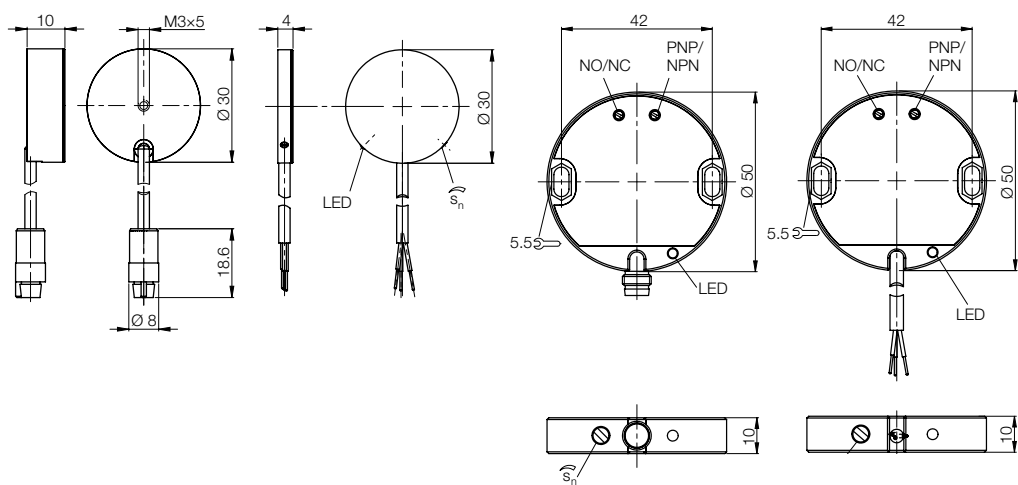
DC 3-wire · Disc types  
 Ø 30 mm, Ø 50 mm



**DC 3-wire**  
 Tubular housings  
**Disc types**  
 Block-style  
 Stick-on sensor

**DC 4-wire**  
 Dynamic function diagnostics

Ø 30x10 mm	Ø 30x4 mm	Ø 50x10 mm	Ø 50x10 mm	
flush	flush	flush	flush	
1...15 mm	2...15 mm	2...25 mm	2...25 mm	
<b>BCS001K</b>				
BCS D30T409-XXS15C-EP02-GZ01-002				
	<b>BCS003A</b>			
	BCS D30T401-PSC15C-EP02			
	<b>BCS003C</b>			
	BCS D30T401-POC15C-EP02			
	<b>BCS003E</b>			
	BCS D30T401-NSC15C-EP02			
	<b>BCS003F</b>			
	BCS D30T401-NOC15C-EP02			
		<b>BCS003L</b>	<b>BCS003K</b>	
		BCS D500003-YPC25C-S49G	BCS D500002-YPC25C-EV02	
4...8 V DC	10...35 V DC	10...30 V DC	10...30 V DC	
75 V DC	≤ 0.8 V	≤ 1.5 V	≤ 2 V	
	75 V DC	75 V DC	75 V DC	
	300 mA	150 mA	150 mA	
	≤ 10 mA	≤ 15 mA	≤ 15 mA	
	yes/yes	yes/yes	yes/yes	
-30...+80 °C	-30...+70 °C	-30...+60 °C	-30...+60 °C	
100 Hz	100 Hz	50 Hz	50 Hz	
	LED yellow	LED yellow	LED yellow	
IP 66	IP 67	IP 65	IP 67	
V2A	V2A	POM	POM	
PTFE	PTFE	POM	POM	
		POM	POM	
2 m cable PUR, 3x0.14 mm <sup>2</sup>	2 m cable PUR, 3x0.14 mm <sup>2</sup>	M8 connector, 3-pin	2 m cable PVC, 3x0.25 mm <sup>2</sup>	



Electrical devices, connectors and holders see Accessories section starting **page 69**

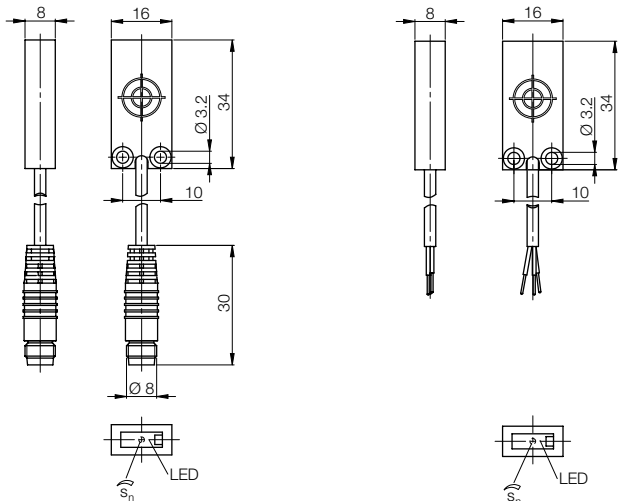
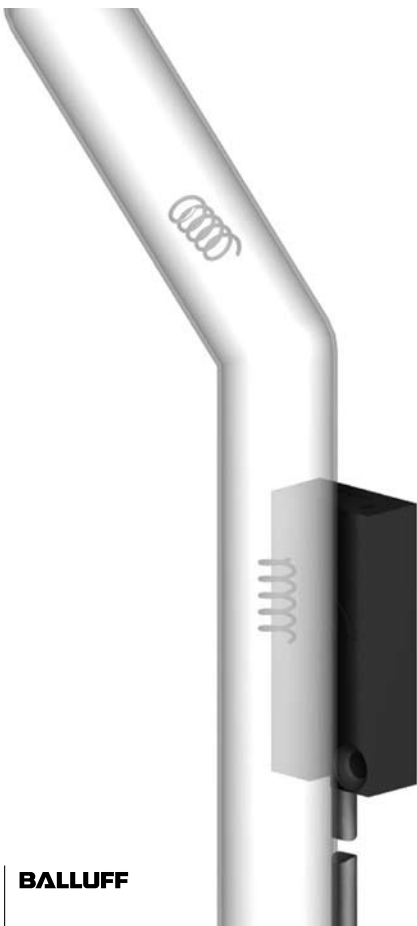


# Object Detection

DC 3-wire · Block-style housings  
Micro-Box 16×34×8 mm



Housing size	<b>16×34×8 mm</b> Micro-Box		<b>16×34×8 mm</b> Micro-Box
Mounting	flush		flush
Rated switching distance $s_n$	<b>1...8 mm</b>		<b>1...8 mm</b>
PNP Normally open	<b>Ordering code</b>	<b>BCS0055</b>	<b>BCS0051</b>
	Part number	BCS R08RR01-PSM80C-EP00,2-GS49	BCS R08RR01-PSM80C-EP02
PNP Normally closed	<b>Ordering code</b>	<b>BCS0056</b>	<b>BCS0052</b>
	Part number	BCS R08RR01-POM80C-EP00,2-GS49	BCS R08RR01-POM80C-EP02
NPN Normally open	<b>Ordering code</b>	<b>BCS0057</b>	<b>BCS0053</b>
	Part number	BCS R08RR01-NSM80C-EP00,2-GS49	BCS R08RR01-NSM80C-EP02
NPN Normally closed	<b>Ordering code</b>	<b>BCS0058</b>	<b>BCS0054</b>
	Part number	BCS R08RR01-NOM80C-EP00,2-GS49	BCS R08RR01-NOM80C-EP02
Supply voltage $U_s$	12...30 V DC		12...30 V DC
Voltage drop $U_d$ at $I_o$	≤ 1.5 V		≤ 1.5 V
Rated insulation voltage $U_i$	75 V DC		75 V DC
Output current max.	50 mA		50 mA
No-load supply current $I_o$ max.	≤ 10 mA		≤ 10 mA
Reverse polarity/short circuit protected	yes/yes		yes/yes
Ambient temperature range $T_a$	-30...+70 °C		-30...+70 °C
Switching frequency $f$	100 Hz		100 Hz
Output function indicator	LED yellow		LED yellow
Degree of protection per IEC 60529	IP 67		IP 67
Material	Housing	PP	PP
	Sensing face	PP	PP
	Cover	PP	PP
Wiring	0.2 m cable PUR, 3×0.14 mm <sup>2</sup> with M8 connector, 3-pin		2 m cable PUR, 3×0.14 mm <sup>2</sup>



Mounting frame included in scope of delivery

Mounting frame included in scope of delivery

# Object Detection

DC 3-wire · Stick-on sensor  
90×16×4 mm



**DC 3-wire**

Tubular housings

Disc types

**Block-style**

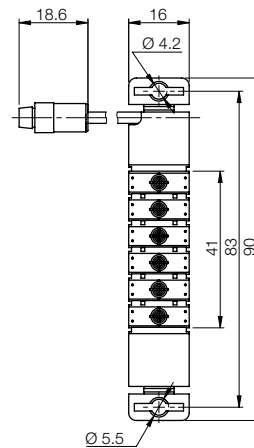
**Stick-on sensor**

**DC 4-wire**

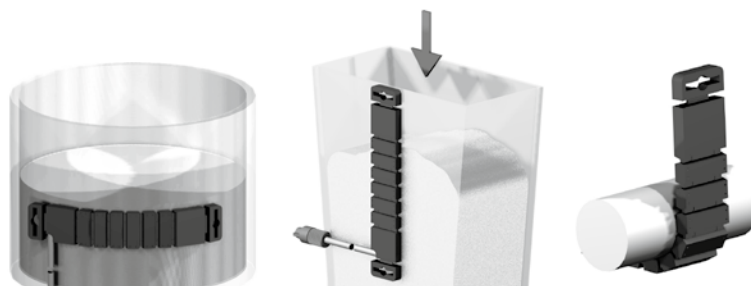
Dynamic function diagnostics

Housing size	<b>90×16×4 mm</b>	
Mounting	flush	
Rated switching distance $s_n$	<b>0...10 mm</b>	
With sensor amplifier	<b>Ordering code</b>	<b>BCS000Y</b>
	Part number	BCS F01CP01-XXS10C-EP02-GZ01-002
Supply voltage $U_s$	4...8 V DC	
Rated insulation voltage $U_i$ (protection class)	75 V DC	
Ambient temperature range $T_a$	0...+60 °C	
Switching frequency $f$	100 Hz	
Degree of protection per IEC 60529	IP 60	
Material	Housing	PC/PUR
	Sensing face	PUR
Wiring	2 m cable PUR, 3×0.14 mm <sup>2</sup>	

For sensor amplifiers see  
Accessories section  
Page 71



Electrical devices,  
connectors and  
holders see  
Accessories  
section starting  
**page 69**



# Object Detection

## DC 4-wire · Dynamic function diagnostics

### Function

Proximity switches with dynamic diagnostics allow monitoring of the sensor functions including the cable.

The oscillator state is changed by means of a pulse generator while the switch is operating. As soon as there is any damage to the sensor head or the oscillator fails electrically, the pulse generator can no longer change the oscillator state and there are no longer pulses on the output.

The pulse frequency is  $f \sim 160 \text{ Hz}$  and the pulse duration  $t \sim 300 \mu\text{s}$ . The pulse-pause ratio of  $t \sim 5 \%$  is selected small enough that the test pulses can be filtered out by the input filter of a controller, or, for example, a relay can be directly driven. The information "proximity switch damped or undamped" can therefore be processed in the usual fashion.

### Function monitoring

The test pulses and thereby the function of the proximity switch are monitored by additional electronics which signal error-free function by means of a high level on the "Status/Output" message output.

For this, Balluff offers a function diagnostics unit which can be easily installed in a controller:



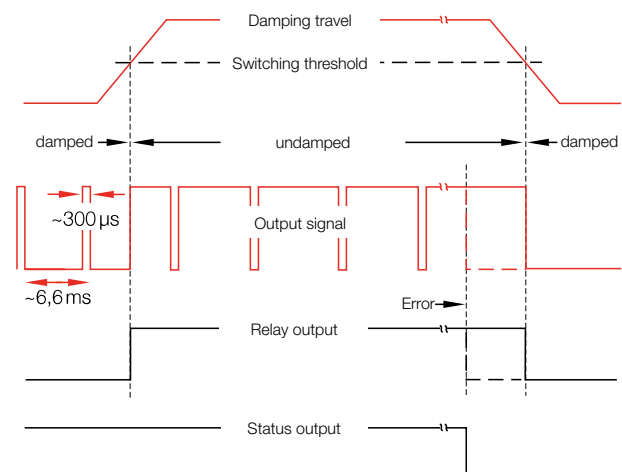
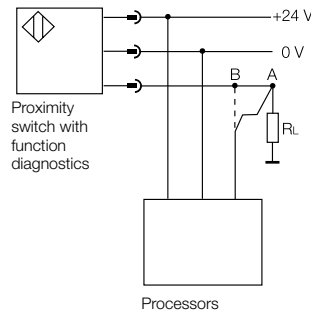
#### Note!

The system described here is not suitable for systems with personal protection. For additional information please request a device description.

### Installation notes

The signal line for the function diagnostics unit should be connected as close to the load  $R_L$  as possible (Point A).

When Point B is connected the cable segment between B and load  $R_L$  is not monitored.



Pulse diagram of a proximity switch with function diagnostics (normally closed)



## Object Detection

DC 4-wire · dynamic function diagnostics  
 Ø 20 mm



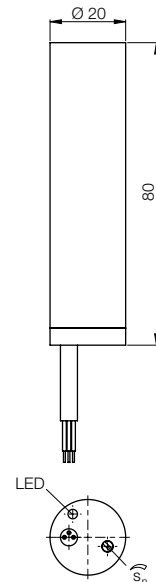
### DC 3-wire

Tubular housings  
 Disc types  
 Block-style  
 Stick-on sensor

### DC 4-wire

Dynamic function diagnostics

Housing size	<b>Ø 20 mm</b>	
Mounting	flush	
Rated switching distance $s_n$	<b>10 mm</b>	
PNP Complementary	<b>Ordering code</b>	<b>BCS0001</b>
	Part number	BCS 20MG10-XPA1Y-8B-03
Supply voltage $U_s$	10...30 V DC	
Voltage drop $U_d$ at $I_a$	≤ 3.5 V	
Rated insulation voltage $U_i$	75 V DC	
Output current max.	130 mA	
No-load supply current $I_0$ max.	≤ 10 mA	
Reverse polarity/short circuit protected	yes/yes	
Ambient temperature range $T_a$	+10...+50 °C	
Switching frequency $f$	100 Hz	
Power indicator	LED green	
Output function indicator	LED yellow	
Degree of protection per IEC 60529	IP 63	
Material	Housing	V2A
	Sensing face	EP
Wiring	3 m cable PUR, 4×0.25 mm <sup>2</sup>	



**Function diagnostics unit**  
 with electronic output,  
 see Accessories section, page 77

Electrical devices,  
 connectors and  
 holders see  
 Accessories  
 section starting  
**page 69**



